

PATENT COOPERATION TREATY
PCT
INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 108687	FOR FURTHER ACTION	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416).
International Application No. PCT/AU2003/000777	International Filing Date (<i>day/month/year</i>) 20 June 2003	Priority Date (<i>day/month/year</i>) 20 June 2002
International Patent Classification (IPC) or national classification and IPC Int. Cl. 7 G01V 3/14, G01R 33/54		
Applicant QR SCIENCES TECHNOLOGIES PTY LTD et al		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 5 sheets, including this cover sheet.

This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of sheet(s).

3. This report contains indications relating to the following items:

- I Basis of the report
- II Priority
- III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV Lack of unity of invention
- V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI Certain documents cited
- VII Certain defects in the international application
- VIII Certain observations on the international application

Date of submission of the demand 31 December 2003	Date of completion of the report 12 October 2004
Name and mailing address of the IPEA/AU AUSTRALIAN PATENT OFFICE PO BOX 200, WODEN ACT 2606, AUSTRALIA E-mail address: pct@ipaaustralia.gov.au Facsimile No. (02) 6285 3929	Authorized Officer SUNIL KAUL Telephone No. (02) 6283 2182

I. Basis of the report**1. With regard to the elements of the international application:***

the international application as originally filed.

the description, pages , as originally filed,
pages , filed with the demand,
pages , received on with the letter of

the claims, pages , as originally filed,
pages , as amended (together with any statement) under Article 19,
pages , filed with the demand,
pages , received on with the letter of

the drawings, pages , as originally filed,
pages , filed with the demand,
pages , received on with the letter of

the sequence listing part of the description:
pages , as originally filed
pages , filed with the demand
pages , received on with the letter of

2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language which is:

the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).

the language of publication of the international application (under Rule 48.3(b)).

the language of the translation furnished for the purposes of international preliminary examination (under Rules 55.2 and/or 55.3).

3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

contained in the international application in written form.

filed together with the international application in computer readable form.

furnished subsequently to this Authority in written form.

furnished subsequently to this Authority in computer readable form.

The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

4. The amendments have resulted in the cancellation of:

the description, pages

the claims, Nos.

the drawings, sheets/fig.

5. This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).**

* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17).

** Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims 3, 5-9, 13-16	YES
	Claims 1-2, 4, 10-12	NO
Inventive step (IS)	Claims 3, 9, 13-16	YES
	Claims 1-2, 4-8, 10-12	NO
Industrial applicability (IA)	Claims 1-16	YES
	Claims	NO

2. Citations and explanations (Rule 70.7)

NOVELTY (N) claims 1-2, 4, 10-12

D1 - WO 96/26453

The invention defined by the claims is not novel in light of D1 which explicitly discloses all the features of the claims identified above.

In regards to claims 1 and 11, D1 discloses an apparatus for producing a multi-pulse sequence for irradiating a substance provided with quadrupole nuclei with either integer or half-integer spins to detect an NQR signal emitted therefrom (page 8, lines 11-18 and page 16, line 28 - page 18, line 5), the apparatus having pulse sequence generating means adapted to produce a combination of two or more pulse sequences, arranged so that a definite regularity of the phase alteration of pulses in each of the pulse sequences occurs that is equivalent to a shift of spectral components of the pulse sequences in relation to each other, and that in at least one of the pulse sequences, there are not less than two phases alternating (page 4, line 20 - page 5, line 21; page 6, line 24 - page 7, line 15; page 8, line 26 - page 9, line 23).

In regards to claim 4, D1 discloses a method for detecting a class of substance containing quadrupole nuclei in a sample using nuclear quadrupole resonance (page 8, lines 11-18), including the following steps: generating a combination of the steady state free precession pulse sequences, the pulse sequences consisting of pulses that contain phases of the carrier frequency chosen from a certain set of unmatched phases distributed within the interval from 0 to 2π radian, with every sequence different from the others either by the number of phases chosen from the set, or by the sequence order inside the sequence; and irradiating the sample with said combination of the pulse sequences (page 36, line 25 - page 37, line 33).

In regards to claim 10, D1 discloses a method for detecting a class of substance containing quadrupole nuclei in a sample using nuclear quadrupole resonance (page 8, lines 11-18), including completing one measurement act using a combination that consists of at least two multi-pulse sequences having the same carrier frequency of the pulses, but different phase shifts between the pulses, in each sequence of the combination (page 4, line 20 - page 5, line 21; page 6, line 24 - page 7, line 15; page 8, line 26 - page 9, line 23).

In regards to claims 2 and 12, it is apparent that the feature included in these dependent claims, consisting of the notion that at least one of the pulse sequences contains a preparatory pulse, is disclosed in D1 (page 6, line 24 - page 7, line 15).

Continued in Supplemental Box.

Supplemental Box

(To be used when the space in any of the preceding boxes is not sufficient)

Continuation of Box V**INVENTIVE STEP (IS) claims 1-2, 4-8, 10-12**

Claims 1-2, 4 and 10-12 as above.

Claims 5-8 lack an inventive step under PCT article 33(3) as being obvious over document D1 as indicated above.

D1 does not specifically disclose the generation of SSFP pulse sequences with a preparatory pulse (claim 5), switching on said preparatory pulse before one or several of the pulse sequences of the combination (claim 6), detecting nuclear resonance signals when the combination of the pulse sequences irradiates the sample and combining all said nuclear quadrupole resonance signals to generate the resulting signal (claim 7) or the predetermined frequency of the pulse sequence is near to one of the NQR frequencies of the substances to be detected (claim 8) in relation to the configuration outlined in claim 4. In other words each of the features in each of these particular claims are outlined in document D1, but just not with regard to the generation of a combination of SSFP pulse sequences as indicated in claim 4, to which these dependent claims are appended to.

It is apparent that claims 1 and 4 and their respective dependent claims all relate to the problem of providing a multi-pulse sequence that reduces the effect of temperature and increases the NQR signal intensity in the detection of NQR signals emitted from specimens of prescribed substances. Thus it would be an obvious solution to apply the features in claims 5-8, which are already disclosed in document D1 yet applied to a different configuration in that specific document, to the configuration outlined in claim 4. Therefore as these features are known to an ordinary person skilled in the art, claims 5-8, when appended to claim 4, do not involve an inventive step.

VIII. Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

1. The following claim is unclear for the reason given below:

There is no antecedent basis for "the predetermined frequency" (claim 8 lines 1-2) when the claim is appended to claims 4-7.

2. Claims 4 and 10 do not appear to be fully supported by the body of the specification in the sense that both of these claims fail to disclose several features which from reading the specification as a whole, appear to be essential to the invention. Hence there is no indication in claims 4 and 10 of there being a definite regularity of the phase alteration of pulses in each of the pulse sequences which is equivalent to a shift of spectral components of the pulse sequences in relation to each other, and that in at least one of the pulse sequences, there are not less than two phases alternating. Therefore claims 4 and 10 are not fully supported by the specification due to the absence of these particular features which appear to be essential to the invention.